Claims

1. A covering agent for a top slag of a metallic melt bath in a metallurgical vessel, in particular used in the steel industry, containing a material which melts on the melt bath and performs metallurgical work, wherein the material substantially comprises granules which have been rendered porous and the porosity of which is such that, at the melt bath temperature, a molten layer of liquid slag is formed on the melt bath, and a thermal barrier layer of the granules is formed above the molten layer of liquid slag.

2. The covering agent as claimed in claim 1, which is present in a grain size fraction of between 1 and 50 mm, in particular between 2 and 20 mm.

3. The covering agent as claimed in claim 1 and/or 2, which is a product made up of shaped granules and/or a pelletized product.

4. The covering agent as claimed in one or more of claims 1 to 3, which is a granulated foam product and/or an expanded, granulated product.

5. The covering agent as claimed in one or more of claims 1 to 4, wherein the grains have a porosity produced by dewatering and/or calcining.

6. The covering agent as claimed in one or more of claims 1 to 5, wherein the grains have a porosity produced by organic combustibles.

7. The covering agent as claimed in one or more of claims 1 to 6, which substantially comprises a calcium aluminate.

8. The covering agent as claimed in claim 7, wherein the calcium aluminates have the following chemical analysis:

CaO/Al_2O_3 from 0.25 to 4, in particular from 1.0 to 1.5,

with preferably up to 15% by mass of auxiliary phases, in particular MgO and/or $MgOSiO_2$ and/or TiO_2 and/or Fe_2O_3 and/or alkali metals being present.

9. The covering agent as claimed in one or more of claims 1 to 8, wherein the grains have a porosity of from 5 to 70% by volume, in particular from 20 to 60% by volume.

10. A process for producing the covering agent as claimed in one or more of claims 1 to 9, in which fine-particle mineral raw materials which react with one another at high temperatures and are suitable for a top slag are mixed and heated until they react, wherein

a) at least one raw material which is dewatered and/or calcined so as to release water vapor and/or gaseous products is used,
b) the mixture is made into a shapeable compound using a combustible binder,
c) the shapeable compound is shaped to form material in grain form, in particular granulated to form granules or pelletized to form pellets,
d) the material in grain form is heated in such a manner that the binder is burnt out, pores are generated by dehydration and/or calcining, and then a ceramic bond and/or a sintered bond is produced between the raw materials.

11. The process as claimed in claim 10, wherein milled raw materials with grain sizes of <90 µm are used.

12. The process as claimed in claim 10 and/or 11, wherein the binders used are water, water glass, synthetic resins, sulfite waste liquor, phosphate compounds and/or calcined lime.

13. A process for producing the covering agent as claimed in one or more of claims 1 to 9, in which fine-particle mineral raw materials which react with one another at high temperatures and are suitable for a top slag are mixed and heated until they react, wherein

a) the raw materials are mixed with a water and a foaming agent and/or an expanding agent and/or a foam, so that pores are introduced into the aqueous compound,
b) the compound is fired until a ceramic bond and/or a sintered bond is produced.

14. The process as claimed in claim 13, wherein the fired product is comminuted and classified.

15. The process as claimed in one or more of claims 10 to 14, wherein organic combustibles are added to the mixture in order to render it porous.

16. The process as claimed in claim 15, wherein paper fibers, sawdust, sawing chips, wood chips and/or styropor granules are added.

17. The process as claimed in one or more of claims 10 to 16, wherein raw materials for producing calcium aluminates are used.

18. The process as claimed in claim 17, wherein raw materials which ensure the following chemistry in the mixture:

CaO/Al_2O_3 from 0.25 to 4, in particular from 1.0 to 1.5

are used.

19. The process as claimed in one or more of claims 10 to 18, wherein raw materials with a fineness of <90 µm are used.

20. The process as claimed in one or more of claims 10 to 19, wherein raw materials which contain up to 15% by mass of auxiliary phases are used.

21. The process as claimed in one or more of claims 10 to 20, wherein the auxiliary phases are MgO and/or $MgOSiO_2$ and/or TiO_2 and/or Fe_2O_3 and/or alkali metals.

22. The process as claimed in one or more of claims 10 to 21, wherein firing is carried out at temperatures of up to 1250°C.

23. The process as claimed in one or more of claims 10 to 22, wherein dewatering and/or calcining raw materials are used.

24. The use of a top slag agent which has been rendered porous and forms a top slag melt and a thermal barrier layer on a metallurgical melt bath, in particular of the top slag agent as claimed in one or more of claims 1 to 9, in particular of a top slag agent produced as described in one or more of claims 10 to 23, as a monolayer coating on a metal melt bath, in particular on a steel melt bath, in particular used in the steel industry.

25. The use of a top slag agent which has been rendered porous and forms a thermal barrier layer on a metallurgical melt bath, in particular of the top slag agent as claimed in one or more of claims 1 to 9, in particular of a top slag agent produced as described in one or more of claims 10 to 23, as a thermal barrier agent on a melt bath or a top slag melt, in particular used in the steel industry.